

## CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. An automatic exposure control and automatic gain control circuit, comprising:

a translation module for transforming an input data stream into x-y coordinates corresponding to said input data stream;

global control registers for defining tiles of an image and assigning weights to said tiles; and

a module for generating and using a histogram based on said x-y coordinates, said tiles, and said assigned tile weights, said module using said histogram to provide an adjustment to analog exposure and gain control registers.

2. The automatic exposure control and automatic gain control circuit according to claim 1, wherein said global control registers further comprise a grid system.

3. The automatic exposure control and automatic gain control circuit according to claim 2, wherein grid coordinates of said grid system are programmable.

4. The automatic exposure control and automatic gain control circuit according to claim 1, wherein said input data stream comprises digital signal values from an analog-to-digital converter of a sensor array.

5. The automatic exposure control and automatic gain control circuit according to claim 1, further comprising a video input module for receiving said input data stream and forwarding said input data stream to said translation module.

6. The automatic exposure control and automatic gain control circuit according to claim 1, wherein said module for generating and using said histogram further comprises:

a histogram generator receiving said input data stream, said x-y coordinates, said tiles, and said assigned tile weight; and

a control module providing said adjustment to said analog exposure control and analog gain control registers, said control module using said histogram created by said histogram generator, said tiles and said assigned tile weights to calculate said adjustment.

7. An imaging processing apparatus, comprising:

a translation module for transforming an input data stream into x-y coordinates corresponding to said input data stream;

global control registers for defining tiles of an image and assigning weights to said tiles; and

a module for generating and using a histogram based on said x-y coordinates, said tiles, and said assigned tile weights to calculate an adjustment, said module using said histogram to provide an adjustment to analog exposure and gain control registers.

8. The imaging processing apparatus according to claim 7, wherein said global control registers further comprise a grid system.

9. The imaging processing apparatus according to claim 8, wherein grid coordinates of said grid system are programmable.

10. The imaging processing apparatus according to claim 7, wherein said input data stream comprises digital signal values from an analog-to-digital converter of a sensor array.

11. The imaging processing apparatus according to claim 7, further comprising a video input module for receiving said input data stream and forwarding said input data stream to said translation module.

12. The imaging processing apparatus according to claim 7, wherein said module for generating and using said histogram further comprises:

a histogram generator receiving said input data stream, said x-y coordinates, said tiles, and said assigned tile weight; and

a control module providing said adjustment to said analog exposure control and analog gain control registers, said control module using said histogram created by said histogram generator, said tiles and said assigned tile weights to calculate said adjustment.

13. A digital camera system comprising:

an image sensor;

an automatic exposure control and automatic gain control circuit for providing an adjustment to analog exposure control and gain control registers; and

an image processor coupled to said automatic exposure control and automatic gain control circuit for forwarding an input data stream to said automatic exposure control and automatic gain control circuit.

14. The digital camera system according to claim 13, wherein said automatic exposure control and automatic gain control circuit further comprises:

at least one processor;

a bus;

a translation module for transforming an input data stream into x-y coordinates corresponding to said input data stream;

global control registers for defining tiles of an image and assigning weights to said tiles; and

a module for generating and using a histogram based on said x-y coordinates, said tiles, and said assigned tile weights, said module, using said histogram, to provide an adjustment to analog exposure and gain control registers.

15. The digital camera system according to claim 14, wherein said global control registers further comprise a grid system.

16. A computer system comprising:

a first processor;

a memory device coupled to said processor via a bus;

at least one input/output device, said at least one input/output device coupled to said processor via said peripheral bus, said input/output device being an imaging device;

said imaging device further comprising:

a translation module for transforming an input data stream into x-y coordinates corresponding to said input data stream;

global control registers for defining tiles of an image and assigning weights to said tiles; and

a module for generating and using a histogram based on said x-y coordinates, said tiles, and said assigned tile weights, said module using said histogram to provide an adjustment to analog exposure and gain control registers.

17. The computer system according to claim 16, wherein said global control registers further comprise a grid system.

18. An integrated circuit comprising:

an automatic exposure control and automatic gain control circuit for providing an adjustment for exposure and gain of an image; and

an image processor coupled to said automatic exposure control and automatic gain control circuit for forwarding an input data stream to said automatic exposure control and automatic gain control circuit from an image sensor.

19. The integrated circuit according to claim 18, wherein said automatic exposure control and automatic gain control circuit further comprises:

a translation module for transforming an input data stream into x-y coordinates corresponding to said input data stream;

global control registers for defining tiles of an image and assigning weights to said tiles; and

a module for generating and using a histogram based on said x-y coordinates, said tiles, and said assigned tile weights to calculate an adjustment, said module using said histogram to provide said adjustment to analog exposure and gain control registers.

20. The integrated circuit according to claim 19, wherein said integrated circuit is a Field Programmable Gate Array.

21. An automated method for pixel exposure control and gain control, the method comprising:

capturing pixel data corresponding to an image; and

adjusting automatically exposure and gain for said image by providing an adjustment to analog exposure control and gain control registers.

22. The method according to claim 21, further comprising:

transforming an input data stream corresponding to captured pixel data into x-y coordinates corresponding to said input data stream;

defining tiles for a region of interest for said image using a grid system;

assigning weights to said defined tiles;

creating an histogram using said x-y coordinates, said defined tiles, and said assigned weights;

using said histogram to generate an adjustment to said exposure and gain for said image; and

applying said adjustment to said analog exposure and gain control registers.

23. The method according to claim 22, wherein grid coordinates of said grid system are programmable.